

# HP 12c Financial Calculator - Managing Dates

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## Calculating with dates

Since financial computations depend on periods of time, the ability to handle dates is important. Knowing the number of days between two dates or computing a new date given a reference date and a number of days between them are often part of financial problems. The HP 12c offers both functions: **ΔDYS** to compute days between dates and **DATE** to compute a new date given a reference day a number of days between them. **ΔDYS** computes the number of days based on both financial and actual years. Dates and date representation are also important when calculating bonds ( **PRICE** and **YTM** ).

## Dates on the HP 12c

Dates can be entered and shown in one of two available formats: 'D.MY' or 'M.DY,' where D is the day number, M is the month number and Y is the year. To set one of these modes, use **9** **M.DY** (to access the blue function on the front face of **5** key) or **9** **D.MY** (to access the blue function on the face of **4** key). 'M.DY' is the default mode, and there is no specific indication for it. If 'D.MY' is set, the display shows:

Figure : Displaying the date format



The HP 12c accepts and computes dates in the range October 15th, 1582 through November 25th, 4046.

## Date representation in the HP 12c

The only data that can be entered in the HP 12c are numbers with up to a ten-digit mantissa and a two-digit exponent of ten. Whether 'D.MY' or 'M.DY' is set, dates are entered as numbers coded this way:

- D represents a valid day and is typed in as a number from 01 to 31.
- M represents the month and is typed in as a number from 01 to 12.
- Y represents the year and is typed in as a number from 1582 to 4046.

The actual number that represents a date is entered in the following format:

- MM.DDYYYY if M.DY is set
- DD.MMYYYY if D.MY is set

Where 'DD' is the day with two digits, 'MM' is the month number with two digits and 'YYYY' is the year with four digits. In either case, typing in leading zeroes for the integer part before the decimal is not necessary.

Although dates are coded accordingly, the date representation that is typed in is only a regular number. The date/number will be checked for validity and format only when a date-related function is performed. So, typing in 1.072004 or 7.012004 does not imply the need for setting   M.DY or   D.MY. Otherwise, performing a date-related function demands using a representation according to the current date format.

Given a reference date and a number of days, a new date is computed with   DATE. The number of dates can be any integer: positive for future dates, negative for past dates and zero for the current day.


## Practice solving problems involving dates

### Example 1

Show how to enter the date September 1<sup>st</sup>, 2004 in M.DY format.

### Solution

The values for this date are: 7 (September), 01 (1<sup>st</sup> day) and 2004 (year). So the keystroke sequence should be:

Keystroke	Display
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p>Figure : Entering the date in M.DY format</p> 

## Answer



The above figure denotes the date entered in M.DY format.

## Example 2

Show how to enter the date September 1<sup>st</sup>, 2004 in 'D.MY' format.

## Solution

The values for this date are the same ones shown in prior example, but their order is different. The keystroke sequence now should be (make sure to clear the display if the previous example was typed in):

Keystroke	Display
	Figure : Entering the date in D.MY format 

## Answer

The above figure denotes the date entered in 'D.MY' format.

## Example 3

A 180-day simple interest loan is taken in January 15<sup>th</sup>, 2002. What is the expiration date? Compute the expiration date using both M.DY and D.MY formats.

## Solution

Make sure M.DY is set. Press:  

The keystroke sequence below computes the expiring date:

Keystroke	Display
	<p>Figure : Calculating the expiration date using the M.DY format</p>

## Answer

The expiring date is July 14<sup>th</sup>, 2002.

The display representation for a computed date is special and shows grouped digits for month, day and year separated by commas or dots, depending on which one is the current radix mark. The rightmost digit represents the day of week, and is interpreted as:

Digits representing the day of the week	Week days
1	Monday
2	Tuesday
3	Wednesday
4	Thursday
5	Friday
6	Saturday

Digits representing the day of the week	Week days
7	Sunday

So, the expiring date July 14<sup>th</sup>, 2002 is also a Sunday. Now, make sure 'D.MY' is set:

Keystroke	Display
	Figure : Displaying the date format 

The keystroke sequence below computes the expiring date in the current date format:

Keystroke	Display
	Figure : Calculating the expiration date using the D.MY format 

## Answer

As expected, the expiring date is July 14<sup>th</sup>, 2002, and it is shown according to the current date format.

## Example 4

What day of the week is October 13<sup>th</sup>, 2003? Enter the date in M.DY format.

## Solution

Make sure M.DY is set. Press:

The keystrokes below make use of the fact that if a date is computed with 0 as the number of days, the original date is returned but analyzed for the day of the week.

Keystroke	Display
<div style="display: flex; justify-content: space-around; border: 1px solid black; padding: 2px;"> <span>1</span><span>0</span><span>.</span><span>1</span><span>3</span><span>2</span><span>0</span><span>0</span><span>3</span><span>ENTER</span> </div> <div style="display: flex; justify-content: space-around; border: 1px solid black; padding: 2px; margin-top: 2px;"> <span>0</span><span>g</span><span>DATE</span> </div>	<p>Figure : Calculating the day of the week using M.DY format</p> <div style="border: 1px solid black; padding: 5px; text-align: center; background-color: #f0f0f0;"> <p>10,13,2003 1</p> </div>

### Answer

October 13<sup>rd</sup>, 2003 was a Monday.

### Example 5

Consider a simple interest accruing from September 10<sup>th</sup>, 2004 to December 14<sup>th</sup>, 2004. What is the number of days between them? Use the current format.

### Solution

From the previous example, the calculator remains in 'M.DY' format:

Keystroke	Display
<div style="display: flex; justify-content: space-around; border: 1px solid black; padding: 2px;"> <span>9</span><span>.</span><span>1</span><span>0</span><span>2</span><span>0</span><span>0</span><span>4</span><span>ENTER</span> </div> <div style="display: flex; justify-content: space-around; border: 1px solid black; padding: 2px; margin-top: 2px;"> <span>1</span><span>2</span><span>.</span><span>1</span><span>4</span><span>2</span><span>0</span><span>0</span><span>4</span><span>g</span><span>ΔDYS</span> </div>	<p>Figure : Displaying the number of days</p> <div style="border: 1px solid black; padding: 5px; text-align: center; background-color: #f0f0f0;"> <p>95.00</p> </div>

### Answer

The result is 95 days.